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Sir:

Transmitted herewith for filing is the patent application of

Inventor(s): KWEON, Hyek Seong; and JOO, Kwang Cheol

For: METHOD FOR DISPLAYING MENU OF TV

Enclosed are:

- ☒ A specification consisting of Twenty-one (21) pages
- ☒ Seven (7) sheet(s) formal drawings
- ☒ An assignment of the invention
- ☒ Certified copy of Priority Document(s)
- ☒ Executed Declaration (☒ Original ☐ Photocopy)
- ☐ A statement (☐ original ☐ photocopy) to establish small entity status under 37 C.F.R. § 1.9 and 37 C.F.R. § 1.27
- ☐ Preliminary Amendment
- ☐ Information Disclosure Statement, PTO-1449 and reference(s)
- ☐ Other:

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Respectfully submitted,

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Attachments

(Rev. 12/29/99)

METHOD FOR DISPLAYING MENU OF TV

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a TV, and more particularly, to a method for displaying an electronic program guide (EPG) menu of a TV.

Background of the Related Art

Generally, a digital TV receiver, as shown in Fig. 1, includes: a tuner 10 to which a broadcasting signal is received; an A/D converter 11 for converting the broadcasting signal received from the tuner 10 into a digital broadcasting data; a channel decoder 12 for detecting a pilot signal from the digital broadcasting data to detect a baseband signal and for performing an error correction for the detected signal; a microcomputer 20 for outputting a control signal in accordance with manipulation of a user; a TP analyzer 13 for analyzing a TP signal in the digital broadcasting signal output from the A/D converter 11 to detect audio/video signals under the control of the microcomputer 20; an MPEG audio decoder 24 for decoding the audio signal analyzed in the TP analyzer 13; an MPEG video decoder 25 for decoding the video signal analyzed in the TP analyzer 13; a digital to analog converter(DAC) 30 for converting the digital audio signal decoded by the MPEG audio decoder 24 into

an analog signal; a flash ROM(read only memory) 40 where channels and programs are stored; a RAM 41 where a temporary data is stored by the operation of the microcomputer 20; and an NTSC encoder 31 for converting the video signal decoded by the MPEG video decoder 25 into an image signal which is displayed on a TV or monitor. Further, an SDRAM 23 is necessary for data processing in the MPEG audio decoder 24 and the MPEG video decoder 25, and a user interface 21 and a CAS interface 22 are necessary for generating an external operation signal for the microcomputer 20.

Generally, the digital broadcasting processes the video signal and the audio signal under the MPEG standard. Particularly, the MPEG standard number for the broadcasting system is ISO/IEC 13818-1, that for the video signal is ISO/IEC 13818-2, and that for the audio signal is ISO/IEC 13818-3. However, the digital TV receiver in U.S.A. does not use the audio signal under the MPEG system and processes it under the standard of DOLBY AC-3.

The tuner 10 receives a Quadrature Phase Shift Keying(QPSK) signal or a Quadrature Amplitude Modulation(QAM) signal from an antenna, and detects and outputs the received signal. The detected signal in the tuner 10 is converted into an intermediate frequency band signal by means of an IF converter(not shown). This is because the detected signal in the tuner 10 is a high frequency signal in a great high frequency band, with which a driving circuit in the digital TV does not deal.

The channel decoder 12 detects the pilot signal in the

intermediate frequency signal to detect the baseband signal and converts the baseband signal into a digital signal. Next, it performs a timing recovery appropriate to a symbol rate and then performs the error correction. The output signal of the channel decoder 12 is a transport stream packet type signal sequence in a byte unit.

The transport signal sequence, which is standardized in the MPEG-2 system, is a time-multiplexed signal sequence, which is called "transport stream packet". The transport signal sequence contains a header on which a packet identifier(PID) number is recorded, on the starting of the packet. The PID number is utilized as the information with which the time-multiplexed signal is demultiplexed. Also, the PID number indicates the type of a current packet, and if the PID number is analyzed, it is detected whether the current packet is a video packet, an audio packet, or program specific information. Particularly, the digital TV standard in U.S.A. includes the program specific information, that is, a program and system information protocol(hereinafter, referred to as 'PSIP').

The PSIP includes a master guide table(MGT) where the versions of all the broadcasting program tables are controlled, a terrestrial virtual channel table(TVCT) where the information for channels is stored, a rating region table(RRT) where a rating table of each program is listed, an event information table(EIT) for providing the information on the current broadcasting programs and

future broadcasting programs, an extended text table(ETT) for providing the detailed information on the current broadcasting programs and future broadcasting programs, and a system time table(STT) for sending a current time.

The video and audio standards in the MPEG-2 system are in connection with the signal sequences of the compressed video and audio. Under the MPEG-2 standard, the video signal, the audio signal and the program specific information are all time-multiplexed and transmitted in several transport stream packets. And, the signal sequences thereof are all discriminated with the PID number.

The TP analyzer 13 analyzes the signal sequence in the transport stream packet with the PID number and applies the analyzed results to each decoders 24 and 25. In more detail, the TP analyzer 13 receives the transport signal sequence received in the tuner 10 and senses the PID number contained on the header of the corresponding signal sequence. Thus, the TP analyzer 13 performs demultiplexing through which the received transport signal sequence is divided into a video signal sequence, an audio signal sequence and a program specific information sequence in accordance with the sensed PID number. Thereby, the TP analyzer 13 applies the video signal sequence to the MPEG video decoder 25, the audio signal sequence to the MPEG audio decoder 24, and the program specific information sequence to the microcomputer 20.

The MPEG video decoder 25 decodes the video signal sequence applied from the TP analyzer 13 and outputs the decoded result to

the NTSC encoder 31. The video signal sequence applied from the TP analyzer 13 is the compressed data in the MPEG-2 system. Therefore, the MPEG video decoder 25 uncompresses the video signal sequence to return to an original digital video data.

The MPEG audio decoder 24 decodes the audio signal sequence applied from the TP analyzer 13 and outputs the decoded result to the DAC 30. The audio signal sequence applied from the TP analyzer 13 is the compressed data in the MPEG-1 system. Therefore, the MPEG audio decoder 24 uncompresses the audio signal sequence to return to an original digital audio data.

The DAC 30 converts the digital audio signal applied from the MPEG audio decoder 24 into analog audio signals(R and L) which are processed in an amplifier or speaker. The analog audio signal is output as voice or sound by means of a stereo speaker(not shown).

The NTSC encoder 31 converts the digital video signal applied from the MPEG video decoder 25 into luminance and chrominance signals(Y and C) which are displayed on a general TV or monitor. The luminance and chrominance signals are displayed as video by means of a CRT(not shown).

The microcomputer 20 controls the operation of the digital TV receiver. The flash ROM 40 stores the program necessary for the control of the microcomputer 20, and the DRAM 41 stores the temporary information or data necessary upon the execution of the control operation of the microcomputer 20.

The aforementioned digital TV receives the program specific

information signal sequence to provide various kinds of interactive program specific information other than broadcasting programs to a viewer. Such interactive program specific information contain home shopping, newspapers, stock information and so on, which are not obtained in an analog TV. The program specific information signal sequence is a transport stream packet type.

The program specific information system of the TV provides a graphic user interface (GUI) to the viewer for convenient use of the program specific information.

Fig. 2 shows an electronic program guide (EPG) of the program specific information of the GUI type. Referring to Fig. 2, a menu screen 50 includes icons 51 and characters 52 explaining the icons. Most of programmers who produce the EPG produce a menu based on a full screen as shown in Fig. 2.

However, the EPG of the related art digital TV has several problems.

In the EPG displayed in the related art digital TV, when the viewer selects a double window mode for simultaneously displaying a broadcasting program screen 60 and an EPG screen 50', a width of the EPG program screen 50' becomes smaller. As a result, widths of the characters and icons become smaller, thereby causing the viewer to be difficult to discriminate the characters 52' and icons 51'.

Furthermore, if the icons are displayed with a menu window 50'' of a picture in picture (PIP) mode as shown in Fig. 4, characters

52'' and icons 51'' have smaller widths and lengths, thereby making difficult for the viewer to discriminate meanings of the characters and icons. Particularly, it is difficult to discriminate meanings of the characters seriously scaled down in their size while meaning of the icons may be discriminated by the viewer to some extent regardless of the double window mode and the PIP mode.

SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a method for displaying a menu of a TV, that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

An object of the present invention is to provide a method for displaying a menu of a TV in which icons and characters are prevented, to the utmost, from being transformed in a screen mode having a variable width, such as a double window mode or a PIP mode, so that meanings of the icons and characters can correctly be discriminated by a user.

Other object of the present invention is to provide a method for displaying a menu of a TV in which icons and characters are displayed by adjusting lengths and widths thereof in accordance with the size of the menu.

Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the

invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, a method for displaying a menu of a TV according to the present invention includes the steps of determining whether or not a menu key is input, determining a current screen display mode if the menu key is input, and displaying a menu element in a menu display area depending on the screen display mode.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

In the drawings:

Fig. 1 is a schematic block diagram showing a general digital TV;

Fig. 2 shows a GUI screen of a general digital TV;

Fig. 3 shows a screen for displaying a TV menu and broadcasting programs in a double window mode;

Fig. 4 shows a screen for displaying a TV menu and broadcasting program in a PIP mode;

Fig. 5 is a flow chart showing a method for displaying a TV menu according to the present invention;

Fig. 6 shows a screen for displaying a TV menu and broadcasting program in a double window mode according to the present invention; and

Fig. 7 shows a screen for displaying a TV menu and broadcasting program in a PIP mode according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

In the present invention, the size of each menu element is variably displayed in accordance with a display mode of a TV, selected by a user.

Fig. 5 is a flow chart showing a method for displaying a TV menu according to the present invention.

In step S100, if a user inputs a menu key to select a screen mode of a TV, the TV of the present invention determines the current screen display mode and divides a display area of the screen in

accordance with the screen mode selected by the user. In the present invention, the menu element is displayed on a menu display area which is set to display a menu in the divided display area of the screen.

If the current screen display mode is a mode which displays a plurality of screens, the menu is displayed on a default screen. At this time, the menu is displayed by adjusting the size of the menu element in accordance with the size of the screen on which the menu is displayed. In general, if area ratio between a region on which the menu is to be displayed and a region in which the menu is occupied is less than 100%, the size of the menu element may preferably be reduced according to area ratio. In this case, the menu element whose size is adjusted may be either characters included in the menu, or icons.

The operation of the TV according to the present invention depends on screen display modes.

The operation of the TV in case of a double window mode will be described below.

If the user selects a screen mode of the TV as a double window mode in step S110, the display area of the TV is divided into a first screen and a second screen having the almost same size in step S120.

If the display area of the TV is divided, either the first screen or the second screen is determined as a menu display area in step S200. At this time, in the present invention, the screen selected by the user as having higher priority order is determined as the menu display area.

If the menu display area is determined, the size of each element constituting menus is varied. Each element has a default size by means of a program of a manufacturer. In the present invention, in step S310, the size of an element is obtained so as to display each element constituting menus on the menu display area. If each element of the menu can be displayed on the determined menu display area even though each element is displayed by the default size, the menu is displayed without separately adjusting the size of the element.

However, when each element is displayed by the default size, if the determined menu display area is too narrow to display each element in step S320, as shown in Fig. 6, the size of each element is reduced and displayed on the screen to display each element of the menu on the menu display area in step S410 and S420. At this time, in the present invention, the size of characters showing each element of the menu is reduced, the size of icons showing each element is reduced, or the sizes of both characters and icons are reduced.

If discrimination is reduced as the size of the reduced characters is seriously smaller than the default size, it is difficult for the viewer to discriminate the element of the menu. To avoid this, the size of the reduced characters is again expanded to the size which is to be discriminated by the viewer. The expansion rate of the reduced characters is set at a value less than a reciprocal number of the reduction rate of characters. For example,

if the size of the characters has been reduced at a size of 50%(1/2) of the default size, the expansion rate is set at a reciprocal number of 50%, i.e., 2 or less. That is, if it is difficult to discriminate characters as the size of the reduced characters is reduced at the size of 50% of the default size, the size of the reduced characters is again expanded at a size less than double size. After all, in step S500, the characters of the menu are displayed at a size less than the original size, i.e., the default size.

The operation of the TV in case of a multi-window mode will be described below.

If the user selects a screen mode of the TV as a multi-window mode in step S110, the display area of the TV is divided into four small screens or more. At this time, the display area of the TV may be divided into either four small screens having the almost same size or nine small screens having the almost same size in step S120.

If the display area of the TV is divided into four small screens or nine small screens, any one of the small screens is determined as a menu display area in step S200. Particularly, in the present invention, the screen selected by the user as having higher priority order is determined as the menu display area. At this time, the screen having higher priority order may be either a small screen located at the corner or a small screen located at the center among the small screens. If the display area of the TV is divided into nine small screens arranged in matrix arrangements, either a corner display area located at the corner or a center display area located

at the center may be set as the menu display area.

If the menu display area is determined, the size of each element constituting menu is varied. Each element has a default size by means of a program of a manufacturer. In the present invention, in step S310, the size of the element is obtained so as to display each element on the menu display area. If each element of the menu can be displayed on the menu display area even though each element is displayed by the default size, the menu is displayed without separately adjusting the size of the element.

However, when each element is displayed by the default size, if the determined menu display area is too narrow to display each element in step S320, the size of each element is reduced and displayed on the screen to display each element of the menu on the menu display area in step S410 and S420. At this time, in the present invention, the size of characters showing each element of the menu is reduced, the size of icons showing each element is reduced, or the sizes of both characters and icons are reduced.

If discrimination is reduced as the size of the reduced characters is seriously smaller than the default size, it is difficult for the viewer to discriminate the element of the menu. To avoid this, the size of the reduced characters is again expanded to the size which is to be discriminated by the viewer. The expansion rate of the reduced characters is set at a value less than a reciprocal number of the reduction rate of characters. For example, if the size of the characters has been reduced at a size of 25%(1/4)

of the default size, the expansion rate is set at a reciprocal number of 25%, i.e., 4 or less. That is, if it is difficult to discriminate characters as the size of the reduced characters is reduced at the size of 25% of the default size, the size of the reduced characters is again expanded at a size less than quadruple size. After all, characters of the menu are displayed at a size less than the original size, i.e., the default size.

If the characters of the menu are maintained at the original size at the state that the menu display area is reduced at 25% of the display area of the TV, all the characters may not be displayed on the menu display area. Particularly, if the width of the character of the menu is reduced less than □ of the original width thereof, respective elements of the menu may overlap each other. In that case, in the present invention, all the characters of the selected element are not displayed but some menu is displayed with maintaining the size of the character at a size to be discriminated by the viewer. Also, in step S500 of the present invention, a menu of a new size is displayed by manipulating a key of the TV so that each element of the menu is scrolled on the menu display area.

The operation of the TV in case of a PIP mode will be described below.

If the user selects a screen mode of the TV as a PIP mode in step S110, the display area of the TV is divided into a main display area having the size of the entire display area and a sub display area overlapping some of the main display area in step S120.

If the display area of the TV is divided into the main display area and the sub display area, any one of the main display area and the sub display area is determined as a menu display area in step S200. At this time, the screen selected by the user as having higher priority order is determined as the menu display area. In general, the user is likely to display the menu on the sub display area smaller than the main display area.

If the sub display area is determined as the menu display area, the size of the element is obtained so as to display each element on the sub display area in step S310. If each element of the menu can be displayed on the sub display area even though each element is displayed by the default size in step S320, the menu is displayed without separately adjusting the size of the element.

However, when each element is displayed by the default size, if the determined sub display area is too narrow to display each element in step S320, the size of each element is reduced and displayed on the screen to display each element of the menu on the sub display area in steps S410 and S420. At this time, in the present invention, the size of characters showing each element of the menu is reduced, the size of icons showing each element is reduced, or the sizes of both characters and icons are reduced.

If the characters of the menu are maintained at the original size at the state that the menu display area is reduced at 25% of the display area of the TV, all the characters may not be displayed on the menu display area. Particularly, if the width of the character

of the menu is reduced less than □ of the original width thereof, respective elements of the menu may overlap each other. In that case, in the present invention, all the characters of the selected element are not displayed but some menu is displayed with maintaining the size of the character at a size to be discriminated by the viewer. Also, in step S500, a menu of a new size as shown in Fig. 7 is displayed by manipulating a key of the TV so that each element of the menu is scrolled in the menu display area.

As aforementioned, the method for displaying a menu of a TV according to the present invention has the following advantages.

Unlike the related art method for displaying a menu of a TV, meanings of icons or characters of the menu can be discriminated by the viewer even though the screen display mode of the TV is varied. In other words, in the present invention, the screen display mode of the TV is varied to the double window mode or the PIP mode by key manipulation of the user so that meanings of the selected element containing icons and characters can be discriminated by the viewer even though the size of the icon and characters of the menu is reduced. Accordingly, it is possible to properly provide specific information services of a TV broadcasting program to the viewer.

It will be apparent to those skilled in the art that various modifications and variations can be made in the method for displaying a menu of a TV according to the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention covers the modifications and

variations of the invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A method for displaying a menu of a TV comprising the steps of:

determining whether or not a menu key is input;

determining a current screen display mode if the menu key is input; and

displaying a menu element in a menu display area depending on the screen display mode.

2. The method for displaying a menu of a TV as claimed in claim 1, wherein the step of displaying the menu element includes the step of displaying the menu on a default screen if the current screen display mode is a mode which displays a plurality of screens.

3. The method for displaying a menu of a TV as claimed in claim 2, wherein the screen display mode displays two screens.

4. The method for displaying a menu of a TV as claimed in claim 3, wherein the two screens include a main display area and a sub display area.

5. The method for displaying a menu of a TV as claimed in claim 3, wherein the screen display mode which displays the two screens is a double window screen display mode.

6. The method for displaying a menu of a TV as claimed in claim 2, wherein the screen display mode is a multi-window screen display mode.

7. The method for displaying a menu of a TV as claimed in claim 1, wherein the step of displaying the menu element includes the step of adjusting the size of the menu element in accordance with the size of the menu display screen.

8. The method for displaying a menu of a TV as claimed in claim 7, wherein the step of adjusting the size of the menu element includes the steps of obtaining area ratio between a region on which the menu is to be displayed and a region in which the menu is occupied, and reducing the size of the menu at a predetermined ratio if the rate is less than 100%.

9. The method for displaying a menu of a TV as claimed in claim 7, wherein the step of adjusting the size of the menu element includes the step of expanding or reducing the size of characters included in the menu element.

10. The method for displaying a menu of a TV as claimed in claim 7, wherein the step of adjusting the size of the menu element includes the step of expanding or reducing the size of icons included

in the menu element.

11. A method for displaying a menu of a TV in which a screen display area is divided to display a plurality of screens as a user selects a screen display mode, the method for displaying a menu of a TV comprising the steps of:

setting one of the plurality of screens as a menu display screen; and

displaying a menu on the menu display screen.

12. The method for displaying a menu of a TV as claimed in claim 11, further comprising the step of adjusting the size of the menu in accordance with the size of the menu display screen.

ABSTRACT OF THE DISCLOSURE

A method for displaying a menu of a TV is disclosed, in which icons and characters are prevented, to the utmost, from being transformed in a screen mode having a variable width, such as a double window mode or a PIP mode, so that meanings of the icons and characters can correctly be discriminated by a user. The method for displaying a menu of a TV includes the steps of selecting a display mode of a TV screen, dividing a display area of the TV screen in accordance with a user's selection, determining a menu display area for displaying a menu element of the TV, and varying the size of the element having a default size in accordance with the size of the menu display area.

FIG.1
Background Art

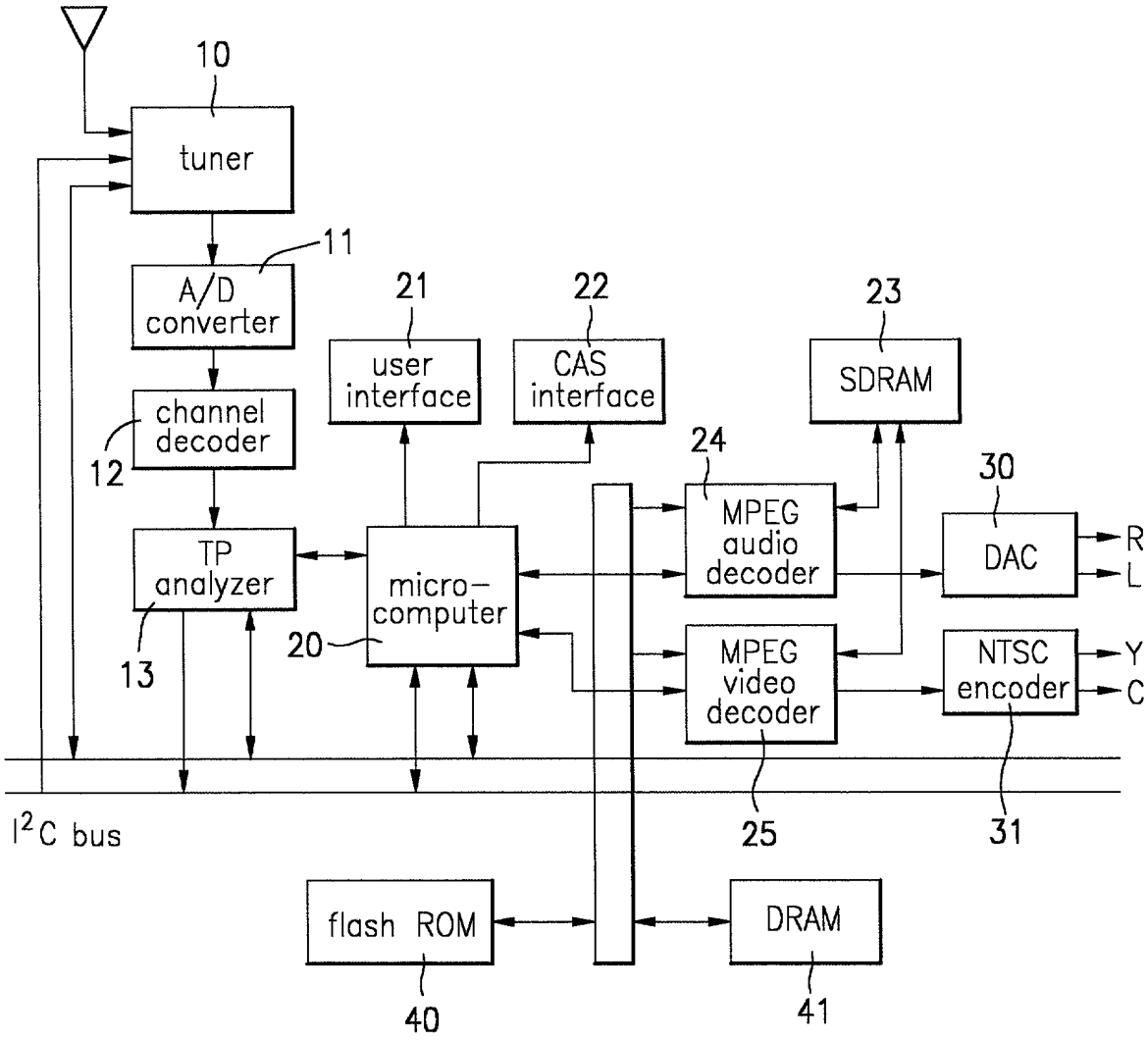


FIG.2

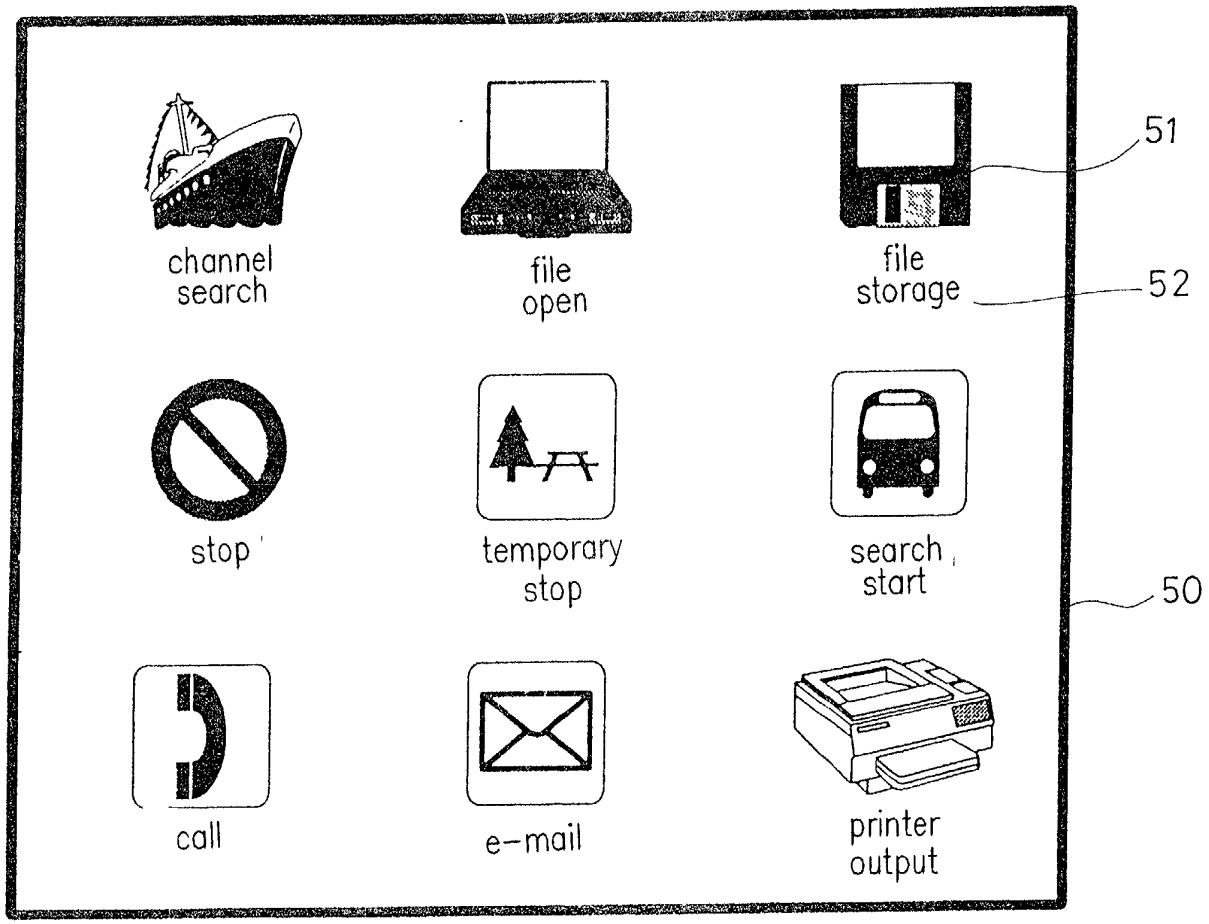

channel search
file open
file storage
51
52
stop
temporary stop
search start
50
call
e-mail
printer output

FIG.3

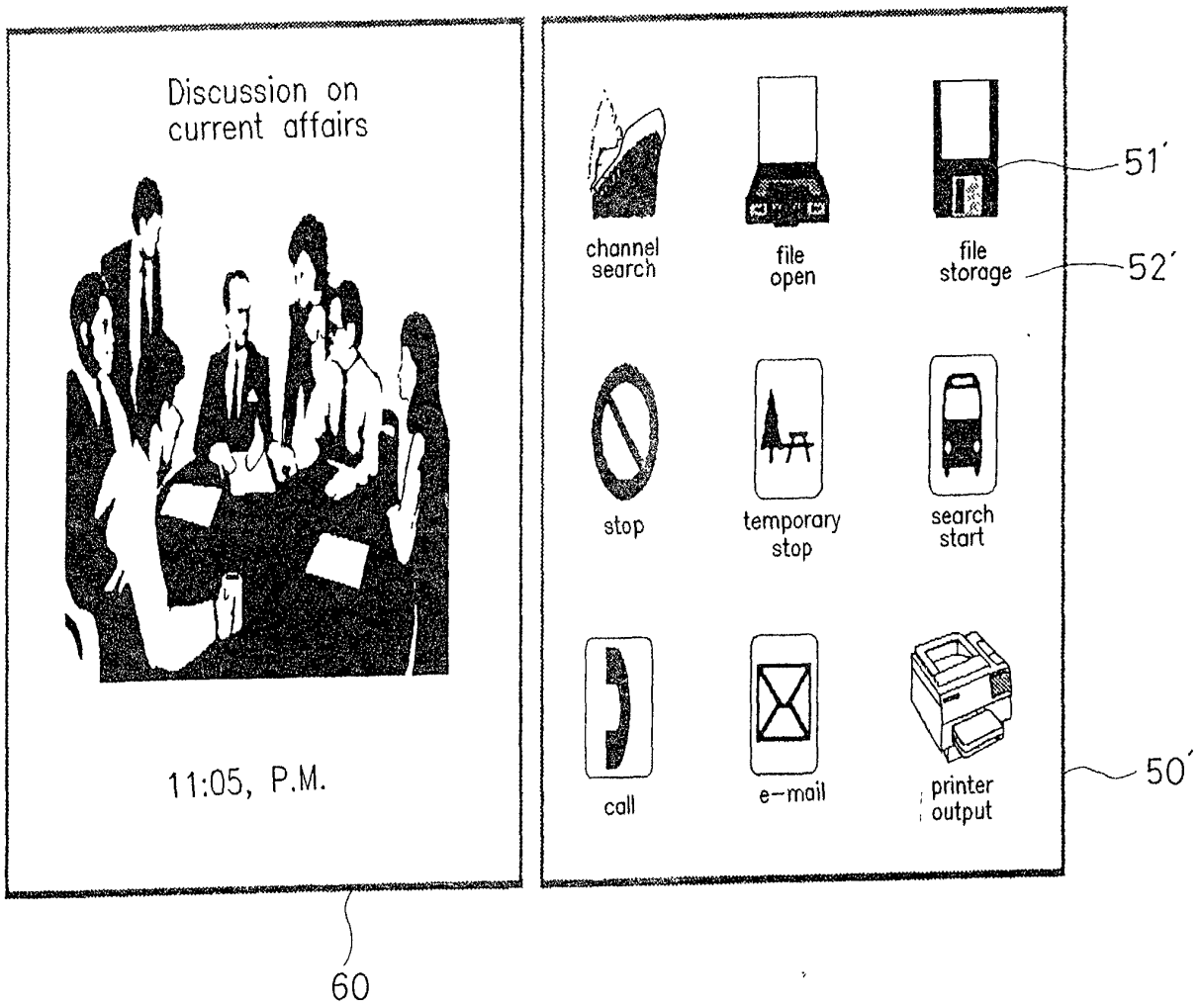

Discussion on current affairs
11:05, P.M.
60
channel search
file open
file storage
51'
52'
stop
temporary stop
search start
call
e-mail
printer output
50'

FIG.4

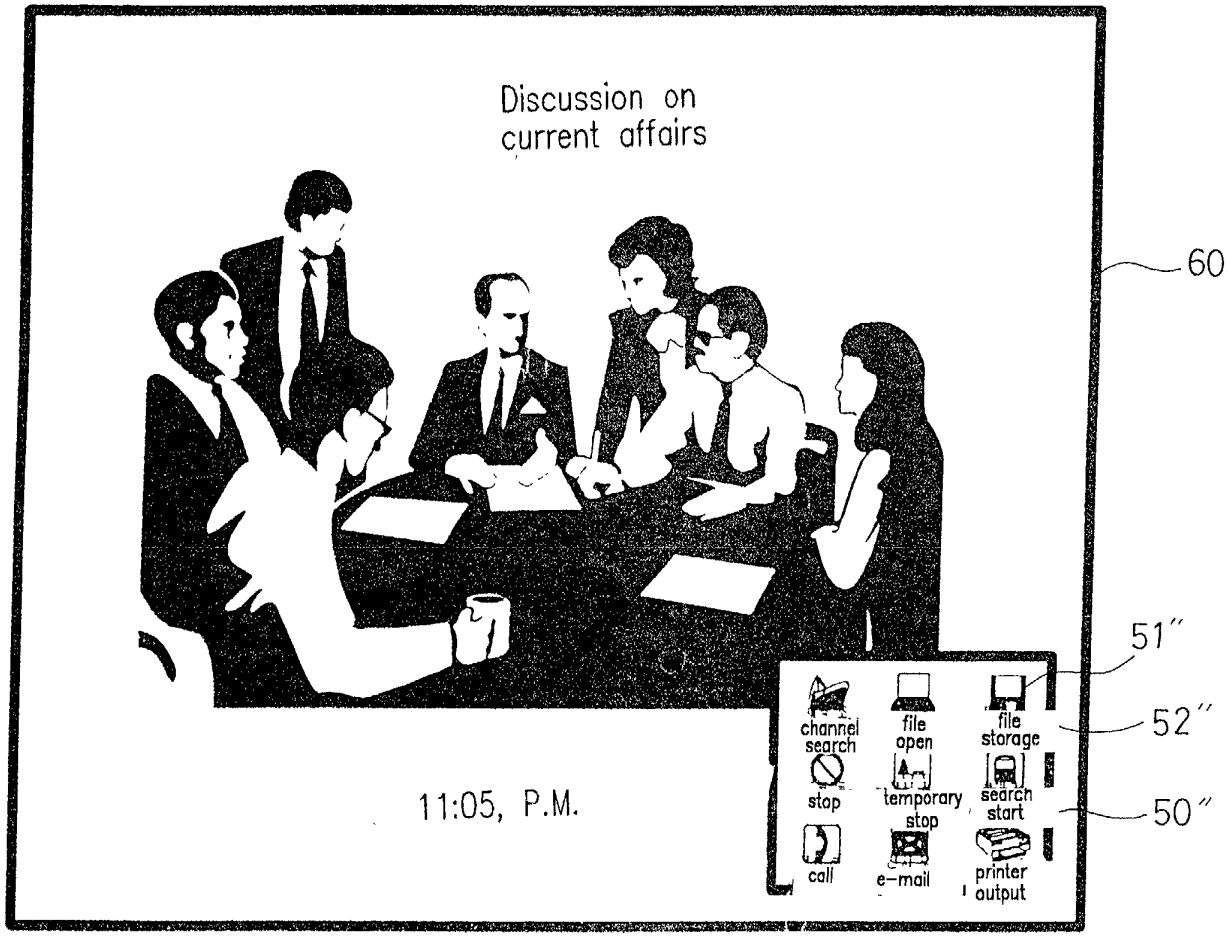

Discussion on
current affairs
11:05, P.M.
channel search
file open
file storage
stop
temporary stop
search start
call
e-mail
printer output
60
51″
52″
50″

FIG.5

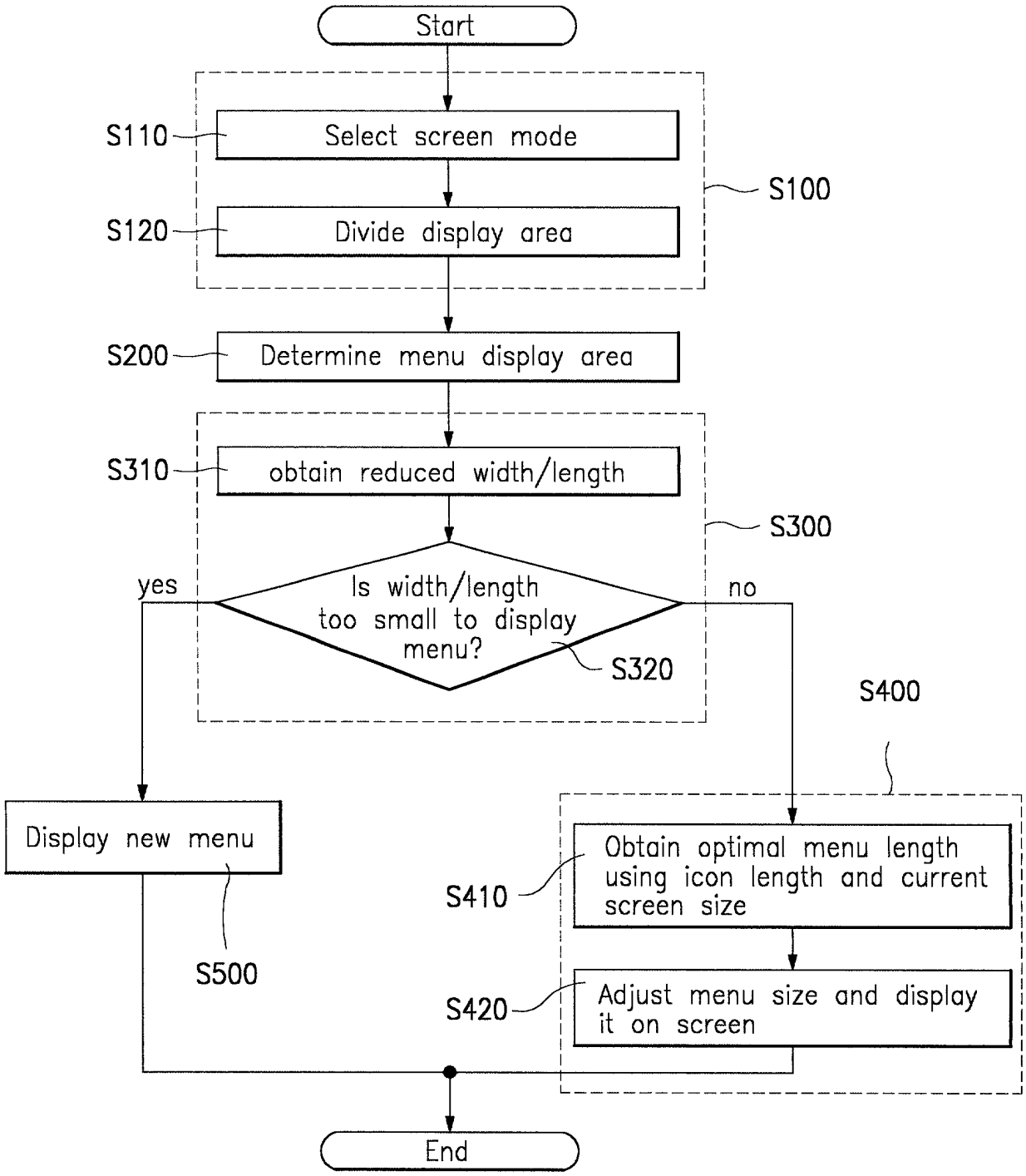

Start
S110
Select screen mode
S120
Divide display area
S100
S200
Determine menu display area
S310
obtain reduced width/length
S300
yes
Is width/length too small to display menu?
S320
no
S400
Display new menu
S500
S410
Obtain optimal menu length using icon length and current screen size
S420
Adjust menu size and display it on screen
End

FIG.6

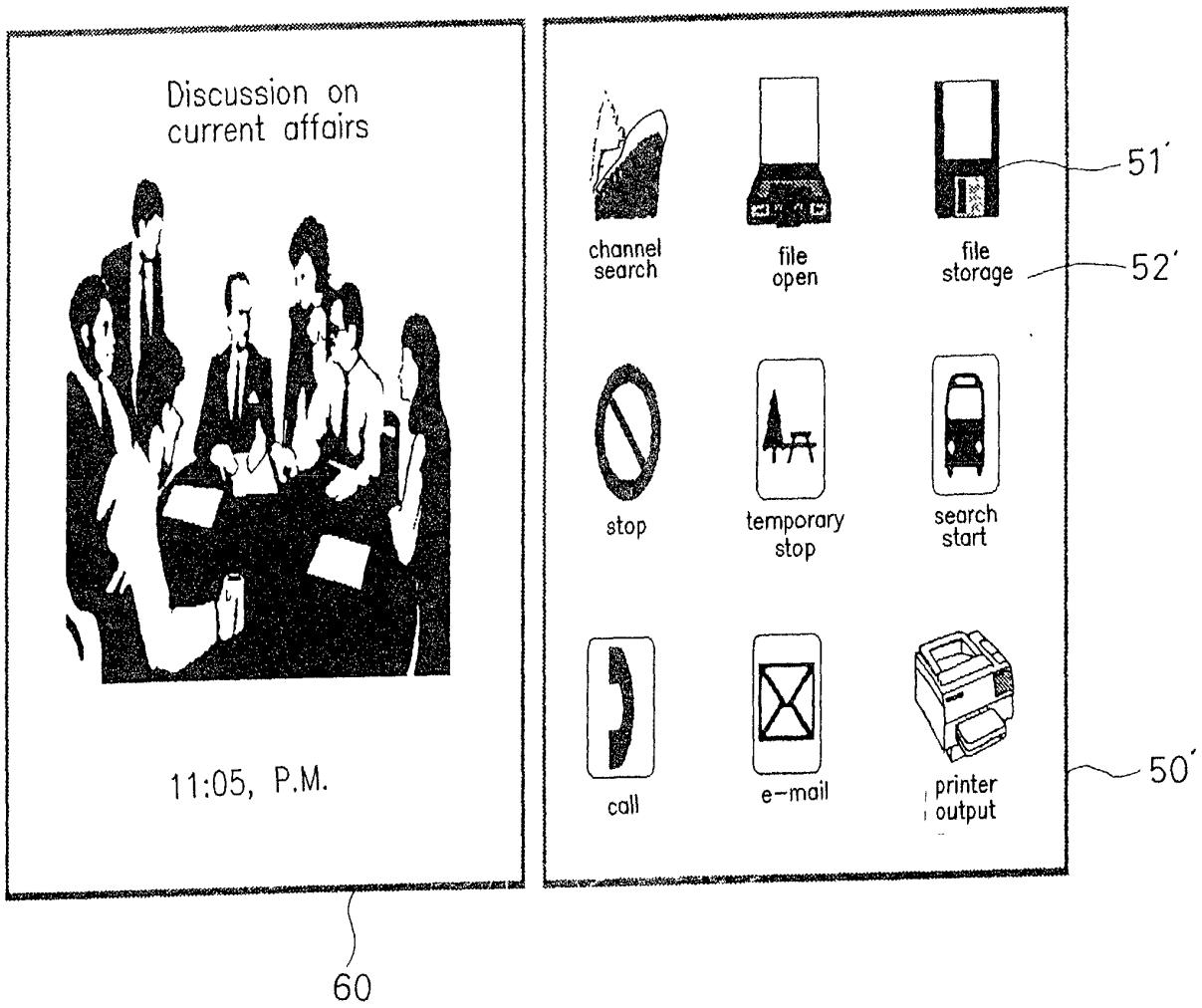
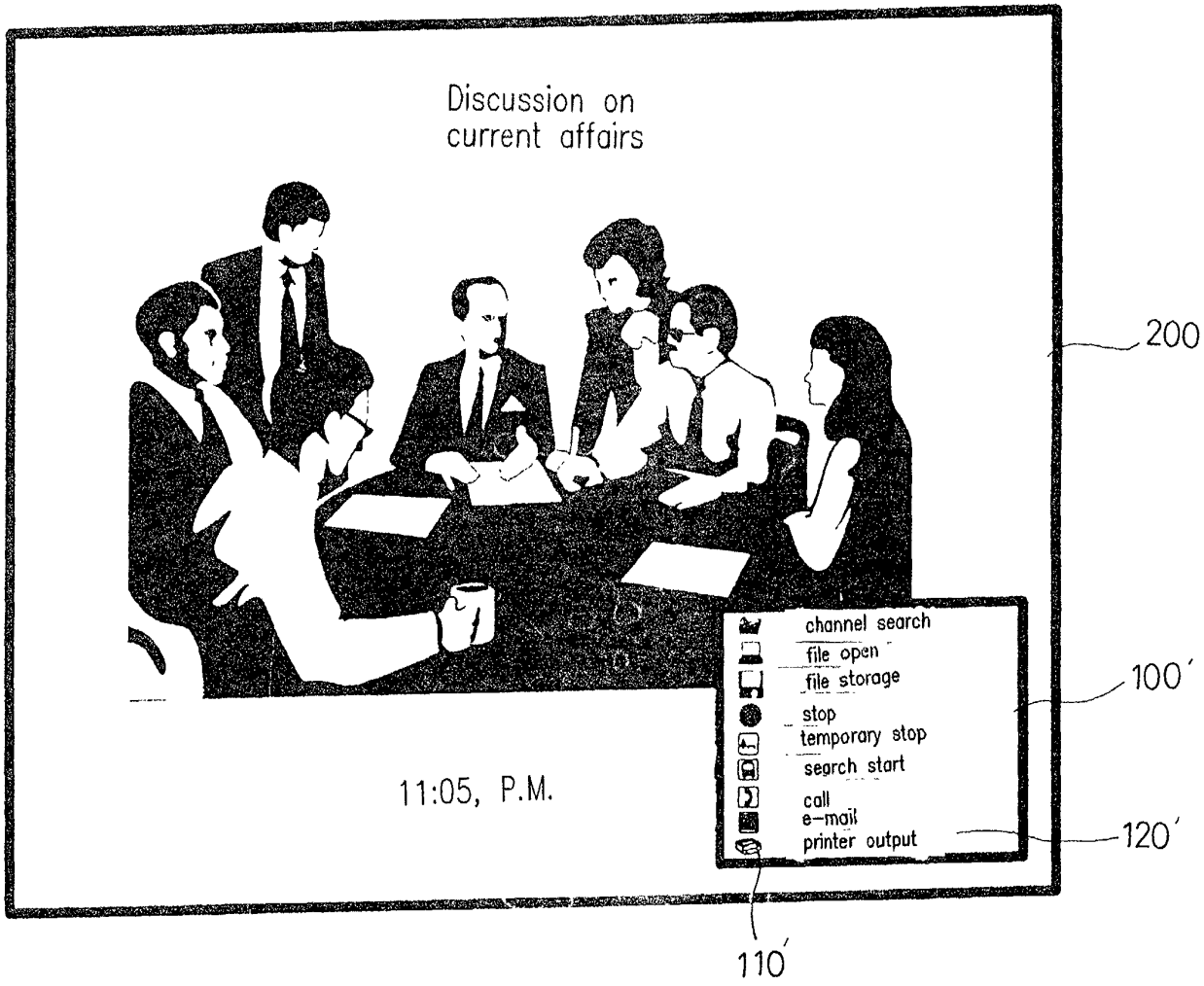

Discussion on current affairs
11:05, P.M.
60
channel search
file open
file storage
51'
52'
stop
temporary stop
search start
call
e-mail
printer output
50'

FIG.7


Discussion on
current affairs
11:05, P.M.
channel search
file open
file storage
stop
temporary stop
search start
call
e-mail
printer output
200
100'
120'
110'

BIRCH, STEWART, KOLASCH & BIRCH, LLP

PLEASE NOTE: YOU MUST COMPLETE THE FOLLOWING:

COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT AND DESIGN APPLICATIONS

ATTORNEY DOCKET NO. 465-647P

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated next to my name; that I verily believe that I am the original, first and sole inventor (if only one inventor is named below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Insert Title: METHOD FOR DISPLAYING MENU OF TV

Fill in Appropriate Information - For Use Without Specification Attached:

the specification of which is attached hereto. If not attached hereto,

the specification was filed on _____ as United States Application Number _____; and /or

the specification was filed on _____ as PCT International Application Number _____; and was amended under PCT Article 19 on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (six months for designs) prior to this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Insert Priority Information: (if appropriate)

Prior Foreign Application(s)

(Number)	(Country)	(Month/Day/Year Filed)	Priority Claimed
62839/1998	Korea	December/31/1998	☒ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

Insert Provisional Application(s): (if any)

(Application Number)	(Filing Date)

All Foreign Applications, if any, for any Patent or Inventor's Certificate Filed More Than 12 Months (6 Months for Designs) Prior To The Filing Date of This Application:

Insert Requested Information: (if appropriate)

Country	Application No.	Date of Filing (Month/Day/Year)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Insert Prior U.S. Application(s): (if any)

(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorneys to prosecute this application and/or an international application based on this application and to transact all business in the Patent and Trademark Office connected therewith and in connection with the resulting patent based on instructions received from the entity who first sent the application papers to the attorneys identified below, unless the inventor(s) or assignee provides said attorneys with a written notice to the contrary:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of First or Sole Inventor: Insert Name of Inventor / Insert Date This Document is Signed / Insert Residence / Insert Citizenship / Insert Post Office Address

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Full Name of Fifth Inventor, if any see above

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* DATE OF SIGNATURE